Claims:

What is claimed is:

1. A ballast for a gas discharge lamp comprising:

a processor for controlling a level of a ballast output signal in response to a plurality of ballast control signals;

an inverter for receiving a processor output signal from said processor and providing said ballast output signal in response to said processor output signal; and

a plurality of input terminals for receiving said plurality of ballast control signals, wherein:

said plurality of ballast control signals is coupled to said processor via said input terminals; and

at least one of said plurality of input terminals is a bidirectional terminal capable of receiving and sending control signals.

2. A ballast in accordance with claim 1, wherein said ballast output signal controls a light level of a gas discharge lamp.

3. A ballast in accordance with claim 1, wherein said at least one bidirectional terminal is coupleable to a control signal for controlling at least one other ballast.

4. A ballast in accordance with claim 1, wherein said plurality of ballast control signals comprises at least one of a digital control signal, an infra-red signal, a serial communications signal, an analog signal, a two-state signal, a signal indicative of a temperature of said ballast, a ballast circuit sense signal, and a phase control signal.

5. A ballast in accordance with claim 1, wherein said processor output signal is a switching signal for controlling at least one switch in said inverter.

6. A ballast in accordance with claim 1, wherein said processor controls said ballast output signal in response to said plurality of ballast control signals in accordance with a selected one of a plurality of predetermined control processes.

7. A ballast in accordance with claim 6, wherein said selected control process is selected via at least one of said plurality of ballast control signals.

8. A ballast in accordance with claim 6, wherein:

parameters of said ballast output signal are determined in accordance with a sequence and priority of values of said ballast control signals; and

each control process comprises a unique priority and sequence algorithm.

9. A ballast in accordance with claim 6, further comprising a memory portion for storing said plurality of predetermined control processes.

10. A distributed ballast system comprising:

a distributed plurality of ballasts coupled together via a bidirectional interface, each ballast comprising:

a processor for controlling a level of a ballast output signal in response to a plurality of ballast control signals;

an inverter for receiving a processor output signal from said processor and providing said ballast output signal in response to said processor output signal; and

a plurality of input terminals for receiving said plurality of ballast control signals, wherein:

said plurality of ballast control signals is coupled to said processor via said input terminals; and

said ballasts of said plurality of ballasts are inter-coupled via a bidirectional interface.

11. A system in accordance with claim 10, wherein:

said bidirectional interface is capable of sending and receiving ballast control signals.

12. A system in accordance with claim 10, wherein said bidirectional interface is capable of sending and receiving ballast control signals for controlling at least one other ballast within said distributed plurality of ballasts.

13. A system in accordance with claim 10, wherein at least one ballast output signal provided by said plurality of ballasts controls a light level of at least one gas discharge lamp.

14. A system in accordance with claim 10, wherein said plurality of ballast control signals comprise at least one of a digital control signal, an infra-red signal, a serial communications signal, an analog signal, a signal indicative of a temperature of said ballast, a ballast circuit sense signal, and a phase control signal.

15. A system in accordance with claim 10, wherein for each ballast, said processor output signal is a switching signal for controlling at least one switch in said inverter.

16. A system in accordance with claim 10, wherein for each ballast said processor controls said ballast output signal in response to said plurality of ballast control signals in accordance with a selected one of a plurality of predetermined control processes.

17. A system in accordance with claim 16, wherein for each ballast said selected control process is selected via at least one of said plurality of ballast control signals.

18. A system in accordance with claim 16, wherein:
parameters of each ballast output signal are determined in accordance with a sequence and priority of values of ballast control signals; and
each control process comprises a unique priority and sequence algorithm.

19. A system in accordance with claim 16, each ballast further comprising a memory portion for storing said plurality of predetermined control processes.

20. A method for controlling a gas discharge lamp with a ballast having a processor therein, said method comprising:
receiving a plurality of control signals by said processor;

determining a ballast output signal for controlling said gas discharge lamp in accordance with a predetermined set point procedure stored in memory of said processor; and controlling a switch of an inverter of said ballast for determining said ballast output signal.

21. A method in accordance with claim 20, wherein said step of controlling said switch comprises predicting when to open and when to close said switch.

22. A method in accordance with claim 20, further comprising selecting said predetermined set point procedure from a plurality of set point procedures in response to said plurality of control signals.

23. A method in accordance with claim 20, wherein said step of controlling said gas discharge lamp in accordance with a predetermined set point procedure comprises controlling said discharge lamp in accordance with an assigned priority and relative sequence of said received plurality of control signals.

24. A method in accordance with claim 20, further comprising the step of providing at least one control signal for controlling at least one other ballast.

25. An electronic ballast for driving a gas discharge lamp, comprising:
an inverter for producing a high frequency drive voltage for driving a lamp current in said gas discharge lamp;
a microprocessor electrically connected to said inverter for directly controlling said inverter to control the said lamp current; and
a port in electrical communications with said microprocessor for sending messages comprising at least one of a command and ballast configuration.

26. An electronic ballast for driving a gas discharge lamp, comprising:
an inverter for producing a high frequency drive voltage for driving a lamp current in said gas discharge lamp;

a microprocessor electrically connected to said inverter for directly controlling said inverter to control the said lamp current; and

a port in electrical communications with said microprocessor for sending messages to at least one of a central controller, a local controller, and a lighting load.

27. The electronic ballast of claim 26, further comprising a port in electrical communication with said microprocessor for at least one of receiving messages, and both receiving and sending messages.

28. The electronic ballast of claim 26, wherein said microprocessor contains a program for determining a status of said electronic ballast and sending a message indicative of said status via said port.

29. The electronic ballast of claim 27, wherein said microprocessor contains a program for responding to a message received via said port by sending a message via said port.

30. The electronic ballast of claim 29, wherein said received message comprises a request for information chosen from the group consisting of on/off condition, running hours, running hours since last lamp change, dim level, operating temperature, and failure conditions.

31. The electronic ballast of claim 26, wherein said microprocessor contains a program for determining a status of said electronic ballast and modulating the lamp current to indicate a predetermined status condition has been reached.

32. The electronic ballast of claim 26, further comprising a transducer in electrical communication with said microprocessor for providing a signal perceptible to a person.

33. The electronic ballast of claim 32, wherein said signal is an audible signal.

34. An electronic ballast for driving a gas discharge lamp, comprising:

an inverter for producing a high frequency drive voltage for driving a lamp current in said gas discharge lamp;

a microprocessor electrically connected to said inverter; said microprocessor for directly controlling said inverter to control said lamp current to a desired level;

a port electrically connected to said microprocessor; said port for receiving messages;

a memory electrically connected to said microprocessor; and

a set of data stored in said memory for facilitating operation of said ballast, wherein a portion of said set of data is changed by said microprocessor in response to a predetermined message received via said port.

35. The electronic ballast of claim 34, wherein said portion of said set of data includes information relating to at least one of the ballast's location and the ballast's duties in a system.

36. The electronic ballast of claim 34, wherein said microprocessor contains a program for determining said desired level; said program using said set of data to determine how a message received via said at least one port should be used to determine said desired level.

37. An electronic ballast for driving at least one gas discharge lamp, comprising:

an inverter circuit producing a high frequency drive voltage for driving a lamp current in said at least one gas discharge lamp;

a microprocessor connected to said inverter; said microprocessor directly controlling said inverter to control said lamp current to a desired level; and

at least two ports connected to said microprocessor, each of said ports being capable of at least one of sending and receiving messages comprising at least one of a command and ballast configuration.

38. An electronic ballast for driving at least one gas discharge lamp, comprising:

an inverter circuit producing a high frequency drive voltage for driving a lamp current in said at least one gas discharge lamp;

a microprocessor connected to said inverter; said microprocessor directly controlling said inverter to control said lamp current to a desired level; and

at least two ports connected to said microprocessor, each of said ports being capable of at least one of sending and receiving messages, respectively, to and from at least one of a central controller, a local controller, and a lighting load.

39. The electronic ballast of claim 38, wherein at least one of said at least two ports is capable of both sending and receiving messages.

40. The electronic ballast of claim 38, further comprising:

a memory connected to said microprocessor; and

a set of data stored in said memory for facilitating operation of said ballast.

41. The electronic ballast of claim 40, further comprising:

a program stored in said microprocessor for determining said desired level;

said program using a portion of said set of data to determine how a message received via said at least two ports is used to determine said desired level.

42. The electronic ballast of claim 40, further comprising:

a program stored in said microprocessor for generating a command for a lighting load; the command being sent via one of said at least two ports, wherein said program utilizes said set of data to determine a content of said command in accordance with a message received via said at least two ports.

43. The electronic ballast of claim 40, wherein at least a portion of said set of data is modifiable in accordance with a message received via at least one of said at least two ports.

44. The electronic ballast of claim 40, wherein at least a portion of said set of data is changed by the microprocessor in response to receiving a predetermined message via at least one of said at least two ports.

45. An electronic ballast for driving at least one gas discharge lamp, comprising:

an inverter circuit producing a high frequency drive voltage for driving a lamp current in said at least one gas discharge lamp;

a microprocessor connected to said inverter; said microprocessor directly controlling said inverter to control said lamp current to a desired level;

at least one port connected to said microprocessor for receiving a message and providing said message to said microprocessor;

a memory connected to said microprocessor; and

a set of data stored in said memory, said microprocessor being adapted to change a portion of said set of data in response to receiving a predetermined message via said at least one port.

46. The electronic ballast of claim 45, wherein said at least one port comprises a port for receiving signals from an IR receiver.

47. The electronic ballast of claim 45, wherein said at least one port comprises a digital communications port.

48. The electronic ballast of claim 47, wherein said at least one port comprises a port for receiving signals from an RF receiver.

49. An electronic ballast for driving at least one gas discharge lamp, comprising:

a control circuit;

a first port connected to said control circuit, said first port being adapted to receive messages; and

a second port connected to said control circuit, said second port being adapted to send messages, said control circuit being adapted to respond to a first message received via said first port by sending a second message via said second port.

50. The electronic ballast of claim 49, wherein said control circuit comprises a microprocessor.

51. The electronic ballast of claim 49, wherein said first message and said second message are substantially the same.

52. The electronic ballast of claim 49, wherein said second message is a command for a lighting load.

53. A lighting system comprising:
a ballast; said ballast comprising a control circuit and a first and a second port connected to said control circuit;
a first light controlling device connected to said first port; and
a second light controlling device connected to said second port;
wherein said first device can communicate with said second device via said control circuit.

54. The lighting system of claim 53, wherein:
said first light controlling device is a device selected from the group consisting of a local control, a central controller and a lighting load; and
said second light controlling device is a device selected from the group consisting of a local control, a central controller and a lighting load.

55. The lighting system of claim 53, wherein a plurality of light controlling devices is connected to said first port.

56. The lighting system of claim 55, wherein a plurality of light controlling devices is connected to said second port.

57. The lighting system of claim 53, wherein said control circuit comprises a microprocessor.

58. The lighting system of claim 53, wherein said first port is capable of receiving signals from an IR receiver.

59. An electronic ballast for driving at least one gas discharge lamp, comprising:
an inverter circuit producing a high frequency drive voltage for driving a lamp current in said at least one gas discharge lamp;

a microprocessor connected to said inverter; said microprocessor directly controlling said inverter to control said lamp current to a desired level;

at least one port connected to said microprocessor; said port being adapted to send a message comprising at least one of a command and ballast configuration; and

a program stored in said microprocessor, said program adapted to determine a status of said electronic ballast and send a message indicative of said status via said at least one port.

60. An electronic ballast for driving at least one gas discharge lamp, comprising:

an inverter circuit producing a high frequency drive voltage for driving a lamp current in said at least one gas discharge lamp;

a microprocessor connected to said inverter; said microprocessor directly controlling said inverter to control said lamp current to a desired level;

at least one port connected to said microprocessor; said port being adapted to send a message to at least one of a central controller, a local controller, and a lighting load; and

a program stored in said microprocessor, said program adapted to determine a status of said electronic ballast and send a message indicative of said status via said at least one port.

61. The electronic ballast of claim 60, wherein said status includes at least one of the group consisting of on/off condition, running hours, running hours since last lamp change, dim level, operating temperature, and failure conditions.

62. An electronic ballast for driving at least one gas discharge lamp, comprising:

an inverter circuit producing a high frequency drive voltage for driving a lamp current in said at least one gas discharge lamp;

a control circuit connected to said inverter; said control circuit directly controlling said inverter to control said lamp current to a desired level; and

at least three ports connected to said control circuit, each of said ports being capable of at least one of sending and receiving messages.

63. The electronic ballast of claim 62, wherein said at least three ports comprise:

an analog port;

a first digital port; and

a second digital port, wherein said first digital port is capable of both sending and receiving messages.

64. The electronic ballast of claim 63, wherein said control circuit is a microprocessor.

65. A method for controlling a gas discharge lamp with a ballast having a processor therein, said method comprising:

receiving a plurality of control signals by said processor;

sampling said received plurality of control signals in accordance with an assigned priority of each control signal; and

controlling said gas discharge lamp in accordance with said sampled control signals.

66. A method in accordance with claim 65, further comprising determining a ballast output signal for controlling said gas discharge lamp in accordance with said sampled control signals.

67. A method in accordance with claim 66, further comprising controlling a switch of an inverter of said ballast for determining said ballast output signal.

68. A method in accordance with claim 67, wherein:

within a predetermined time period, each control signal assigned a high priority above a predetermined threshold priority value is sampled more often than each control signal assigned a low priority less than said predetermined threshold priority value.

69. A method in accordance with claim 68, wherein:

within a series of said predetermined time periods, each control signal assigned a high priority is sampled during each time period in said series; and

control signals assigned a low priority are sampled during alternate time periods within said series.